

**Original citation:**

Dedman, Elisabeth, Kausar, Asad and Lennox, Clive . (2013) The demand for audit in private firms : recent large-sample evidence from the UK. *European Accounting Review*, Volume 23 (Number 1). pp. 1-23.

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On: 30 July 2014, At: 01:31

Publisher: Routledge

Informa Ltd Registered in England and Wales Registered Number: 1072954 Registered office: Mortimer House, 37-41 Mortimer Street, London W1T 3JH, UK



## European Accounting Review

Publication details, including instructions for authors and subscription information:

<http://www.tandfonline.com/loi/rear20>

### The Demand for Audit in Private Firms: Recent Large-Sample Evidence from the UK

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Published online: 14 Mar 2013.

To cite this article: Elisabeth Dedman, Asad Kausar & Clive Lennox (2014) The Demand for Audit in Private Firms: Recent Large-Sample Evidence from the UK, *European Accounting Review*, 23:1, 1-23, DOI: [10.1080/09638180.2013.776298](https://doi.org/10.1080/09638180.2013.776298)

To link to this article: <http://dx.doi.org/10.1080/09638180.2013.776298>

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# The Demand for Audit in Private Firms: Recent Large-Sample Evidence from the UK

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(Received: July 2011; accepted: January 2013)

**ABSTRACT** Although theory suggests that companies would rationally select into audit even if it were not a legal requirement, many countries impose mandatory audits. This is arguably due to an audit having elements of a public good, which may result in not enough audits being purchased without regulatory intervention. The mandatory nature of public company audit has created problems for researchers wishing to investigate the demand for voluntary audit. Recent events in the UK, however, have provided such an environment. In the UK, private companies must publicly file financial statements and, until recently, they had also to be audited. However, this requirement has now been relaxed for many private companies. We are therefore able to examine the determinants of voluntary audit in a large sample of companies for which we have financial statement data. We analyse a sample of 6274 recently exempt companies, following them for three years post-exemption. We use agency theory and prior evidence to generate our hypotheses and examine them using a more comprehensive set of explanatory variables than has previously been available in the literature. Our results indicate that companies are more likely to purchase voluntary audits if they have greater agency costs, are riskier, wish to raise capital, purchase non-audit services from their auditor, and exhibited greater demand for audit assurance in the mandatory audit regime. We also document a trend away from audit over time. Overall, our results strongly support the idea that companies choose to be audited when it is in their interests to do so.

## 1. Introduction

The external audit of publicly owned companies may be viewed as a public good in that any party may use the audited information in the financial statements without either contributing to its cost or reducing its availability to other users. The outcome of the audit is informative to suppliers of capital and credit, as well as to all other current and potential stakeholders in a company. The public good element of the service is one of the justifications employed by the many regulators that mandate audits as a condition of stock exchange listing. It is argued that, absent regulation, there may be under-provision of audit resulting in a social loss (Rennie *et al.*, 2003; Lennox and Pittman, 2011).

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Paper accepted by Ann Vanstraelen

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The case for mandatory audit in private companies is less clear, as these companies exist in a different environment, where stakeholders tend to be closer to the company and are able to request extra information directly. This may help explain why the regulatory requirement for mandatory audits is much less consistent in the non-listed sector. For example, in the USA, the Securities Exchange Act of 1934 (s.12(g,)) only requires companies with asset values exceeding \$10m and widely dispersed ownership (more than 500 ‘holders of record’) to produce financial statements (Abdel-Khalik, 1993; Allee and Yohn, 2009). In Australia, private companies were historically exempt from audit, until 1998, when amendments to the Australian Corporations Law mandated audit for larger private companies (Carey *et al.*, 2000). The UK has historically required all companies, public and private, to file audited financial statements and to make them publicly available, this being one of the costs of limited liability (Godwin and Freedman, 1993).

Recently, though, the UK has adopted company size-based exemptions to the audit for most categories of private company. The argument for relaxing the rules is that the audit requirement imposes costs on many companies for which there is limited attendant benefit. Regulators posit that private companies will retain the audit if it is beneficial for them to do so (BERR, 2004).<sup>1</sup> However, large-scale evidence on the incentives to voluntarily purchase an audit has hitherto been unavailable.

The important question as to which companies would select into audit in a voluntary environment has long interested researchers, but has proved difficult to examine empirically. This is because regulators often do not require disclosure of financial statements by private companies. Previous researchers in the area, struggling to identify suitable experimental settings, have been forced to innovate with respect to their samples, for example, using historical data from the pre-Securities and Exchange Commission period for US companies (Chow, 1982), or not-for-profit organisations (Hay and Davis, 2004). Scant archival data from the financial statements has also imposed limits on the number of explanatory variables included in the analysis, or forced researchers into conducting surveys (Carey *et al.*, 2000; Senkow *et al.*, 2001; Seow, 2001; Rennie *et al.*, 2003; Collis *et al.*, 2004). The sample sizes in these prior studies are therefore somewhat limited.

The UK audit exemption, coupled with the remaining requirement that even audit-exempt private companies file financial statements in a public repository (Companies House), provides a rare opportunity to examine this issue using archival data on a large sample of companies and using a more comprehensive set of variables than has been available to previous researchers. In particular, we incorporate into our analyses measures of agency problems which were not available to previous researchers examining the demand for voluntary auditing. These include board size, ownership dispersion, and company complexity, as well as more detailed information on risky balance sheet assets (inventory, receivables and cash), and other factors predicted to be associated with the demand for audit assurance, such as company age. This setting also allows us to test the relationship between voluntary audit and companies’ intentions to raise new capital. This is important because such an association would suggest that shareholders/investors perceive audited financial statements to be informative signals of company value. We also include variables tested in prior literature, such as leverage and company size, as well as testing others, where previous evidence has been lacking (e.g. the relationship between auditing and the purchase of non-audit services (NAS)). A further benefit of the UK setting is that we are able to examine the audit decision for three years post-exemption and document trends in the frequency of purchase.

<sup>1</sup>The UK regulator at the time was the Department for Business, Enterprise and Regulatory Reform, which was superseded in 2009 by the Department for Business, Innovation and Skills.

We develop and test hypotheses relating voluntary audit to: (i) agency costs; (ii) company risk; (iii) the requirement for extra capital; (iv) spillovers between the provision of audit services and NAS; and (v) measures of the past demand for audit assurance. Our sample consists of 6274 companies, which became newly exempt from audit in 2004, and we follow these companies and their audit decisions until 2006, when there was another audit-exemption threshold change for small companies. Our results indicate that companies are more likely to purchase an audit when they have higher agency costs, require capital, purchase more NAS, and demonstrated a higher demand for audit assurance during the mandatory audit period. We also observe a strong trend away from audit over time, indicating that it takes time for companies to respond to the relaxation of the mandatory audit requirement.

This paper contributes to the existing literature in several ways. It provides an examination of the demand for audit using a larger sample and a more comprehensive set of variables than has previously been possible. Our findings support the idea that small companies are able to understand the costs and benefits of audit. Our study also contributes to our understanding of the demand for auditing, as it shows that companies suffering from agency problems are more likely to purchase an audit. Finally, in an environment where the political costs of purchasing NAS are small, companies perceive that the benefits of joint provision of audit services and NAS outweigh any negative consequences.

The rest of the paper is organised as follows: the next section describes the regulatory background in the UK; Section 3 reviews prior literature and develops our hypotheses; Section 4 describes the methodology employed in the study; Section 5 reports the results of our analyses; Section 6 describes some sensitivity tests; and Section 7 provides a summary and conclusions.

## 2. Institutional Background

Independent audits were initially mandated in the UK by the Joint Stock Companies Act of 1844, though Watts and Zimmerman (1983) provide evidence that the new law was simply a codification of common practice at the time. The Companies Act of 1948 introduced the concept of ‘exempt private companies’, which were not obligated to file accounts, in order to protect the privacy of small, family enterprises. Further, exempt private companies were permitted to appoint auditors with lower levels of qualifications than non-exempt companies.<sup>2</sup> This soon became the prevailing form of private company and was used by many businesses which were much larger than those the 1948 Act was designed to protect. The Companies Act of 1967 therefore abolished the category of exempt private companies, allowing some size-based disclosure exemptions (Dedman and Lennox, 2009), but returning to the requirement that all limited liability companies annually submit financial accounts which had been audited by an independent, qualified person. The reasoning behind this was to protect creditors and the public, the benefit of which was deemed to outweigh the privacy arguments which dominated in the 1948 Act (Leigh, 1968). It has often been argued that the provision of audited financial statements is the price to be paid for limited liability (Godwin and Freedman, 1993). It may further be argued that, in a voluntary regime, too few companies would purchase audits, which confer positive externalities on external users of financial statements (e.g. creditors,

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<sup>2</sup>Section 161(1), which required the auditor of a company to be a ‘member of a body of accountants established in the United Kingdom and for the time being recognised for the purposes of this provision by the Board of Trade’, did not apply to exempt private companies. Section 161(2)(b), which precluded ‘a person who is a partner of or in the employment of an officer or servant of the company’ from conducting the company audit, also did not apply to exempt private companies.

employees, the government) and which companies may not fully take into account when deciding whether to purchase an audit.<sup>3</sup>

Between 1967 and the introduction of size-based audit exemptions in 1994, all UK private companies were required to undergo a statutory audit. The initial exemption was introduced to reduce the costs imposed on very small private companies and applied to companies which qualified as small, and which reported turnover not exceeding £90,000, alongside a balance sheet total not exceeding £1.4m.<sup>4</sup> The cost of audit to very small companies has been argued to be disproportionately high and difficult to justify given the limited benefits that an audit confers on the users of these accounts (Keasey *et al.*, 1988). Subsequent extensions, applied via amendments to the UK Companies Act (1985), have culminated in the exemption thresholds being brought into line with those applied by the EU, with the largest threshold change occurring in 2004.<sup>5</sup> From 30 January 2004, private companies could opt out of having an audit if any two of the following three size criteria were met: (1) sales  $\leq$  £5.6m, (2) assets  $\leq$  £2.8m, and (3) employees  $\leq$  50. These threshold changes provide us with a sample of companies that became exempt from mandatory audits for the first time in 2004. It is the companies' response to this new option which forms the subject of our inquiry.<sup>6</sup>

### 3. Prior Literature and Hypothesis Development

Jensen and Meckling (1976) suggest that external financial statement audits provide a partial solution to the agency costs arising from the separation of ownership and control in organisations. Their hypotheses regarding audit are applicable to both public corporations and private companies, where the manager does not own 100% of the assets under his control. In this situation, agency costs can be reduced by having the financial information verified by a third party and given to the providers of finance. The providers of finance are then able to use that information to assess the risk of the company, and lenders are able to write debt covenants based upon it.

Watts and Zimmerman (1983) use these arguments to explain why so many UK businesses subjected themselves to some form of voluntary audit as early as the fourteenth century, 500 years prior to government fiat in the area. Researchers investigating later time periods have attempted to predict and test which individual company characteristics are associated with voluntary audit.

We expect that companies with higher levels of agency costs will be more likely to purchase an audit when it is not mandatory. Jensen and Meckling (1976) hypothesise that agency costs increase with company size 'because it is likely that the monitoring function is inherently more difficult and expensive in a larger organization' [p. 59]. Further, it is argued that there is more wealth at risk in larger companies, which also increases agency costs (Abdel-Khalik, 1993). Larger companies are therefore predicted to be more likely to voluntarily purchase an audit.

Jensen and Meckling (1976) also posit that agency costs increase with the proportion of outside financing of the company. This is because, as the manager's ownership stake decreases, so does the cost to him of extracting non-pecuniary benefits from the company. Providers of finance recognise this and price-protect themselves. It therefore becomes optimal for both

<sup>3</sup>On the other hand, an argument against mandatory audits is that it prevents companies from using voluntary audit to signal their type (Titman and Trueman, 1986; Lennox and Pittman, 2011).

<sup>4</sup>Companies Act 1985 (Audit Exemption Regulations) 1994 (SI 1994/1935).

<sup>5</sup>Companies Act 1985 (Audit Exemption Regulations) 2004 (SI 2004/14).

<sup>6</sup>None of the companies in our sample had year-ends falling between 1 and 29 January 2004. Henceforth, we therefore refer to the voluntary audit regime as starting in 2004.



parties (lender and manager) to contract to have an audit. The greater the amount of outside financing involved, the more likely a company will reduce lender risk by purchasing independent attestation of the financial statements. Additionally, lenders may impose covenant restrictions on the company, which can be efficiently based upon the audited financial information (Watts, 2003).

Notwithstanding the difficulty of finding an appropriate experimental setting, various scholars have attempted to empirically test the relationship between agency costs and voluntary audit. In particular, they look for evidence that voluntary audit is positively associated with: (i) the separation of ownership and control; (ii) the size of the organisation; and (iii) the degree of external financing of the company.

Chow (1982) examines the accounts of 165 New York stock exchange (NYSE) and over the counter (OTC) companies from 1926, prior to the Securities Act of 1934, which introduced mandatory audit for public companies. He reports that 48% of OTC companies, and 79% of NYSE companies, underwent financial statement audit. He also finds that audited companies were bigger, and more highly geared, than were unaudited companies. Counting the number of debt covenants related to accounting measures, Chow (1982) finds that audited companies were subject to more accounting-based covenant restrictions than unaudited companies, and the number of covenant restrictions is significantly positively correlated with company leverage. Also in the USA, but using survey data on private, manufacturing companies Abdel-Khalik (1993) finds external audit to be commonly purchased. Using audit fee as a measure of the demand for audit assurance, he finds that audit fees are positively associated with company size and with the presence of debt covenants.

Hay and Davis (2004) find a positive association between agency costs and the demand for audit assurance in non-profit companies that have limited liability in New Zealand. Using a sample of 380 incorporated societies, they find that most such organisations (79%) purchase some sort of audit.<sup>7</sup> In addition, larger, more highly levered societies are more likely to undergo a voluntary audit. Australian researchers (Carey *et al.*, 2000) have investigated the voluntary audit choice of private companies prior to the 1998 amendments to Australian Corporations Law, which mandated audit for larger, private companies. Using data from a postal survey of 186 privately owned Australian companies, they report that 46% of sample companies purchased an external audit. Size was not found to be a significant factor, though the predicted positive association between leverage and the demand for external audit was observed. Carey *et al.* (2000) also found a positive association between the demand for external audit and the separation of ownership from control, measured as the proportion of directors (and managers) who were not family members.

Canada provides the nearest example to the UK environment under examination in this paper. The Canada Business Corporations Act (CBCA) 1975 required large private companies (i.e. turnover > \$10m or assets > \$5m) to publicly disclose audited financial statements. This provision was later removed from the CBCA, effective June 1994. An important difference between Canada and the UK is that the revised CBCA also released audit-exempt companies from the requirement to file financial statements. In contrast, public filing is still mandatory in the UK, even for audit-exempt companies. Canadian researchers, seeking to understand the voluntary audit decision, have therefore employed survey methods rather than archival financial statement data. Rennie *et al.* (2003) used a postal questionnaire to obtain data from 204 CFOs of newly exempt Canadian private companies. In the first year of exemption, 73% of sample companies

<sup>7</sup>Examples of incorporated societies include the New Zealand Rugby Union and the New Zealand Automobile Association.



reported that they had retained the audit. The most important reason for keeping the audit was that it was a requirement of lenders; the primary reason for discontinuance was reported as cost savings. Senkow *et al.* (2001) use 201 observations from the same data set to conduct multi-variate analysis of the audit retention decision. Although their measures of company size and leverage are not significantly associated with voluntary audit, they report a positive relationship between audit retention and the presence of a lender agreement requiring audit. In addition, sample companies are more likely to keep the audit if they pay higher audit fees, providing validation for the idea that audit fees represent a measure of the demand for audit assurance (Abdel-Khalik, 1993).

As detailed in the previous section, the UK also relaxed the audit requirement for private companies in 1994, though the exemption (at that time) applied to smaller companies than those affected in Canada. Although archival data is publicly available, current evidence on the determinants of audit decisions of UK companies is survey-based. Seow (2001) conducted semi-structured telephone interviews with directors of 32 small companies. Her univariate tests indicate that the voluntary audit decision in these companies was largely based upon lenders' requirements. She also reports that audited companies had a greater number of non-director shareholders than the unaudited companies, suggesting that dispersed ownership is associated with the demand for audit in small companies. However, Seow (2001) finds no evidence that levels of debt and the provision of NAS are associated with the audit decision.

Collis *et al.* (2004) issued a postal questionnaire to a sample of private companies classed as small in 1999, soliciting the views of directors *prior* to the reforms, which would exempt their companies from audit. Of 352 respondents, 68% indicated they would keep the audit on a voluntary basis. Using a family ownership variable as a measure of agency problems, Collis *et al.* (2004) report that the probability of a company retaining the audit is positively associated with agency costs. Larger companies expressed an intention to keep the audit, as did the companies that routinely provided audited financial statements to their bank. Collis (2012) follows up this work with a survey of audit-exempt companies, asking about their *actual* decisions with respect to financial reporting and audit in 2006. The sample of 425 companies includes 282 micro companies, and is therefore, not restricted to recently exempt companies. The results in Collis (2012) support the results from her 2004 study in that sample companies are more likely to undergo voluntary audit if providers of finance demand audited financial statements, though this result does not hold for the subset of micro companies. In this later study, no association is found between family ownership and the likelihood of audit.

There is therefore a growing body of international evidence suggesting that voluntary audit is associated with agency costs in various types of organisations, from public companies to private companies to not-for-profit entities. Common measures of agency costs employed in these studies include company size, leverage, and ownership dispersion. There are, however, other company characteristics associated with agency costs, which have not been included in the voluntary audit literature. These include board size and company complexity.

Jensen (1993) argues that larger boards are less effective as they are easier for the CEO to control. Further, the benefits of having more directors can be outweighed by problems of coordination. Large boards find it more difficult to reach a consensus, due to there being more opinions to manage, as well as the logistical difficulties of organising meetings (Lipton and Lorsch, 1992). Such propositions have found empirical support in the literature. For example, researchers consistently document a negative relationship between board size and company performance in a variety of contexts: in US public companies (Yermack, 1996); in Finland, where boards tend to be much smaller than in the USA (Eisenberg *et al.*, 1998); and in the UK (Guest, 2009). Although this evidence is obtained using data from public companies, the underlying rationale applies equally to private companies. Therefore, it may be expected that private companies with

larger boards would suffer problems of communication and coordination, which could be mitigated by financial statement audit.

Simunic and Stein (1987) posit that agency costs increase with company complexity, and others have found that complexity increases the demand for audit assurance in private companies (Abdel-Khalik, 1993).

H1 therefore tests the relationship between the agency costs described above and voluntary audit, using variables consistent with prior literature, as well as introducing additional measures of agency costs:

*H1: Companies which voluntarily purchase a financial statement audit are larger, more complex, more highly levered, with greater ownership dispersion and larger boards than companies which choose to opt out of the audit.*

Next, we examine the association between measures of company risk (including company performance, the proportion of balance sheet assets classed as 'risky' and the age of the company) and the demand for voluntary audit. Companies which are struggling with poor performance have enhanced incentives to manipulate performance (Rogers and Stocken, 2005) and may therefore wish to signal that they have *not* resorted to earnings management by having an audit.<sup>8</sup> However, a client's financial distress can impose risk on the auditor, which is likely to lead to increased fees (Simunic, 1980) and which will in turn negatively affect demand.

Private companies with higher proportions of receivables and inventory may wish to obtain validation of these balances, which are likely important to external users such as suppliers. Small UK companies have relatively high failure rates (Urwin *et al.*, 2008) and so suppliers are likely to value any reassurance that they will be paid. Such assurance to users has been found to be an important determinant of the demand for voluntary audit (Rennie *et al.*, 2003), in which case we would expect high levels of inventory and receivables to have a positive influence on demand. However, Simunic (1980) points out that these 'risky balance sheet components' are difficult to audit, requiring observation and confirmation, and that they increase the auditor's liability exposure. Similarly, creditors will prefer to see high levels of cash on the balance sheet, but small, private, cash-based businesses are difficult to audit due to problems of verifiability (Godwin and Freedman, 1993). High levels of inventory, receivables and cash are therefore associated with increased audit costs, which will have a negative effect on demand.

Finally, we posit that younger companies are more risky to audit as information asymmetry is higher (Diamond, 1989; Rajan and Zingales, 1998), and this will increase the cost of audit, thereby reducing demand. Further, Pittman and Fortin (2004) provide evidence that the value of audit assurance to newly public companies (in terms of borrowing costs) is lower for companies with longer private histories. Their study indicates that private companies build up valuable reputations in credit markets over time so that the monitoring value of the audit is reduced. We therefore expect to observe a negative relationship between the age of private companies and the likelihood of a voluntary audit.

In short, we expect that company risk increases the value of independent auditor attestation, which makes it more likely that a risky company will purchase an audit. On the other hand, we expect auditors to price this risk by charging higher audit fees and this makes it less likely that a

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<sup>8</sup>While listed companies may direct such a signal to public capital markets, private companies are more likely to wish to provide assurance to trade suppliers (regarding liquidity) and to their banks (regarding asset values and income, *inter alia*).

risky company will purchase an audit. As we are unable to make a directional prediction, H2 about company risk factors is expressed in the null form:

*H2: The demand for voluntary audit in private companies does not vary with financial performance, the proportion of risky balance sheet items, and the company's age.*

The above discussion suggests that lenders often require companies to undergo audit. There is also evidence in the literature that voluntary audit leads to a reduction in interest rates. Blackwell *et al.* (1998) argue that, 'If auditor assurance reduces lenders' monitoring costs (Watts and Zimmerman, 1986), competition will force banks to pass along the cost reductions to borrowing in the form of lower interest rates, *ceteris paribus*' (p. 58). They test this proposition by analysing a sample of 212 revolving credit agreements relating to small, private/closely held US companies and provide evidence that voluntary audit is indeed associated with lower interest rates in these companies. Larger scale tests have been conducted in South Korea with similar results. South Korea is similar to the UK in that many private companies file detailed financial statements despite not being subject to a mandatory audit requirement. This enables Kim *et al.* (2011) to test the association between voluntary audit and a measure of company interest rates in a large sample over a long time period ( $n = 72,577$  over 16 years). Kim *et al.* (2011) find that the interest rate spread is significantly lower for audited company-years, after controlling for other company factors, such as leverage, profitability, size and growth. Researchers examining this issue using UK data do not focus on interest rates, but on a publicly available credit rating, the QuiScore. Lennox and Pittman (2011) point to problems with trying to construct a measure of interest rates using UK data, while Dedman and Kausar (2012) argue that, as loans are not necessarily renegotiated annually, the QuiScore provides a more responsive measure of the effect of choosing a voluntary audit. This strand of research resonates with the assertion that the audit provides valuable protection to creditors (Leigh, 1968). Both Lennox and Pittman (2011) and Dedman and Kausar (2012) report a strong positive relationship between voluntary audit and credit ratings in large samples of UK companies. This supports survey evidence collected by Collis (2012) who reports that directors of private UK companies believe that voluntary audit will have a positive effect on their companies' credit scores.

Given the evidence that voluntary audit has a positive effect on credit ratings and is associated with reduced borrowing costs, we expect companies are more likely to retain the audit, if they intend to raise equity capital. This is because external auditing can credibly certify the quality of a company's financial statements. Such certification may lessen uncertainty about future growth/company value and shareholders will be relatively more confident in investing in the business. This leads to H3:

*H3: Companies are more likely to undergo a voluntary audit if they intend to raise capital in the next financial period.*

H4 focuses on the association between an auditor's provision of NAS and a client's demand for voluntary audit. Simunic (1984) argues that joint production of NAS and audit generates efficiency gains in the form of cost savings and knowledge externalities, as undertaking one task informs the other. For example, the quality of tax or management advisory services is probably higher, when the advisory company has performed the audit (Senkow *et al.*, 2001). Moreover, prior studies report a significant association between audit and non-audit fees (e.g. Simunic, 1984; Palmrose, 1986; Davis *et al.*, 1993; Bell *et al.*, 2001), suggesting that knowledge spillovers occur between the two types of services. Joint provision may, however, reduce the independence of the auditor, leading to a lower likelihood of them reporting truthfully on the financial

statements (Simunic, 1984). Although the debate on whether the provision of NAS compromises audit quality goes back to the 1950s (Francis, 2006), recent corporate scandals, such as Enron and Worldcom have led regulators in the USA and UK to enact new measures designed to improve investor confidence in the audit (Porter *et al.*, 2008). It is worth noting here that there is no strong evidence that the quality of the audit is in fact compromised by the auditor's provision of NAS (Francis, 2006; Porter *et al.*, 2008). There is, however, evidence that the provision of NAS impairs investors' perceptions of auditor independence. For example, the market response to quarterly earnings surprises has been found to be lower for companies which report higher levels of NAS purchases from their auditor (Krishnan *et al.*, 2005; Francis and Ke, 2006). Enhancing the appearance of independence is important to market regulators and limiting the ability of auditors to provide NAS has featured prominently in their responses to Enron, etc. In the UK, for example, the Auditing Practices Board (APB) has issued five Ethical Standards (ES), which detail 'safeguards' designed to protect the objectivity and independence of the auditor, including restrictions on the provision of NAS (ES 5).

The small private companies in our sample are exempt from certain requirements of the five ES and are permitted instead to apply the Ethical Standard Provisions Available for Small Entities (PASE). With respect to the provision of NAS, PASE relaxes the requirement of ES 5 for audit firms to '... apply safeguards to address a self-review threat ...' (APB, 2005, para. 7). The small company auditor is '... not required to adhere to the prohibitions in APB ES 5, relating to providing NAS that involve the audit firm undertaking part of the role of management ...' (para. 12). PASE also allows the audit firm to undertake tax services which involve advocacy work. As with all exemptions taken under PASE, the audit firm is obligated to disclose this in the audit report.<sup>9</sup>

While public companies have strong incentives to create the appearance of auditor independence and so may be reluctant to purchase NAS (Firth, 1997), this is less of a concern for private companies. Prior research has identified 'knowledge spillovers' which generate efficiencies in the joint production of audit and NAS (Simunic, 1984; Senkow *et al.*, 2001). The NAS provided to small private companies may improve the value of having an audit, making it more likely that the private company would purchase an audit.<sup>10</sup> As the incremental cost of the audit is lower for NAS purchasers, we expect that they are more likely to buy a voluntary audit, all else equal. This leads to H4:

*H4: Private companies that purchased non-audit services from their auditor in the mandatory audit regime will be more likely to retain the audit in the voluntary audit regime.*

H5 captures the effect of other measures of the demand for audit assurance on the audit decision of private companies. A company with a higher demand for audit assurance is more likely to purchase an audit voluntarily. The extant literature indicates that companies appoint Big Four audit firms rather than smaller auditors when they have a high demand for audit quality (see the review in Francis, 2004). Prior studies also suggest that a company with a high demand for audit assurance pays a higher audit fee, presumably as compensation to the auditor for a higher quality audit (Abdel-Khalik, 1993; Bell *et al.*, 2001). We therefore expect that companies which demanded greater audit assurance in the last year of the mandatory audit regime will continue to purchase an audit in the voluntary regime.

<sup>9</sup>The other exemptions available under PASE relate to economic dependence and an audit partner joining a client company.

<sup>10</sup>We thank an anonymous reviewer for pointing this out.

*H5: Companies who employed a Big4 auditor, and/or which paid higher audit fees in 2003, will be more likely to retain the audit after 2004.*

## 4. Sample and Method

### 4.1 Sample Selection and Research Method

Using the FAME (Financial Analysis Made Easy) database, we first identify all independent private companies that were required to have audits in 2003, but which would become exempt in 2004 (the first year of the voluntary regime), should their turnover, assets, and employees figures remain unchanged. Specifically, we select small, independent private companies with: *either* sales > £1m *or* total assets > £1.4m in 2003; and sales < £5.6m *and* total assets < £2.8m in years 2003 and 2004.<sup>11</sup> Next, we exclude companies which grew beyond the exemption thresholds (sales of £5.6m or total assets of £2.8m) in 2005 or 2006. After dropping companies with missing financial statement data on FAME, we are left with a final sample of 15,013 company-years, covering the first three years of the voluntary audit regime, 2004–2006.

We test the relationship between our variables of interest and the voluntary demand for auditing in 2004–2006 by estimating the following probit models:

$$\begin{aligned} \text{AUDIT}_{i,t} = & \alpha + \beta_1 \ln(\text{ASSETS})_{i,t} + \beta_2 \ln(\text{SALES})_{i,t} \\ & + \beta_3 \text{SUBSIDS}_{i,t} + \beta_4 \text{LEVERAGE}_{i,t} + \beta_5 \# \text{SHAREHOLDERS}_{i,t} \\ & + \beta_6 \# \text{DIRECTORS}_{i,t} + \beta_7 \text{ROA}_{i,t} + \beta_8 \text{INTCOV}_{i,t} + \beta_9 \ln(\text{AGE})_{i,t} \\ & + \beta_{10} \text{REC}_{i,t} + \beta_{11} \text{INV}_{i,t} + \beta_{12} \text{CASH}_{i,t} + \beta_{13} \text{CAPDUM}_{i,t+1} \\ & + \beta_{14} \ln(\text{NAS})_{i,2003} + \beta_{15} \text{BIG}_{i,2003} + \beta_{16} \ln(\text{AUDITFEE})_{i,2003} \\ & + \text{Industry-specific effects} + \text{Year effects} + \varepsilon. \end{aligned} \quad (1)$$

Our dependent variable (AUDIT) takes the value one if the company opts for a voluntary audit in the period 2004–2006 and it equals zero otherwise.

The independent variables are motivated by theory as discussed in Section 3. Variables and their definitions are discussed in Section 4.2. For convenience Table 1 summarises our independent variables and their hypothesised relationships with the demand for voluntary audit. All the continuous variables are winsorised at the 1st and 99th percentiles to reduce the influence of outliers. We include industry dummy variables to control for variation in the demand for auditing across industry sectors. We include two-year dummies (YEAR05 and YEAR06) because our data suggest that the frequency of companies opting out of audit increased during the sample period (2004–2006). Finally, our sample consists of panel data with multiple annual observations relating to a single company, which creates potential time-series dependence in the residuals of a given company. Accordingly, we adjust the standard errors for clustering on each company (Rogers, 1994; Petersen, 2009).<sup>12</sup> In alternative specifications, we re-run our probit models separately for each of the three years (i.e. 2004, 2005, and 2006).

<sup>11</sup>To be classed as small by the regulator, companies must satisfy two out of three size criteria over a period of two years, the first two criteria being the same as the turnover and total asset audit exemption thresholds and the third being a maximum average number of employees of 50.

<sup>12</sup>Our results are also robust to estimations using a random-effects model. Wooldridge (2002) points out that there is no fixed-effects probit model.

**Table 1.** Independent variables, hypotheses tested and their expected influence on the demand for voluntary auditing

Variable name	Description	Hypothesis tested	Predicted sign
ln(ASSETS)	Natural log of total assets	H1: agency costs	+
ln(SALES)	Natural log of total sales	H1	+
SUBSIDS	One if the company has one or more subsidiaries, zero otherwise	H1	+
LEVERAGE	Total debt divided by total assets	H1	+
#SHAREHOLDERS	The total number of shareholders	H1	+
#DIRECTORS	The total number of directors on the board	H1	+
ROA	Pre-tax profits divided by total assets in 2003	H2: firm risk	?
INTCOV	One if interest coverage (profits before interest and tax divided by the interest expense) is above the sample median (for sample firms reporting interest expense), zero otherwise	H2	?
ln(AGE)	Natural log of the company's age	H2	—
RECEIVABLES	Receivables/total assets	H2	?
INVENTORY	Inventory/total assets	H2	?
CASH	Cash and cash equivalents/total assets	H2	?
CAPDUM	One if the company issues new equity capital during the year following audit	H3: new capital	+
ln(NAS)	The natural log of (one plus) NAS fees in 2003	H4: audit and NAS	+
BIG	One if the company was audited by a Big Four audit firm in 2003, zero if non-Big Four	H5: audit assurance	+
ln(AUDITFEE)	The natural log of (one plus) audit fees in 2003	H5	+

## 4.2 Variable Selection

We wish to test the association between the decision to purchase a voluntary audit and predictors of demand for audit, which we categorise in our hypotheses as measures of: H1, agency costs; H2, company risk; H3, requirement for capital; H4, joint provision of audit services and NAS; and H5, prior demand for audit assurance.

### 4.2.1 Agency cost variables

H1 requires measures of company size, complexity, leverage, ownership dispersion, and board size. We use two measures of company size in our tests, the natural logarithms of total assets and sales. Following Simunic (1980), we measure company complexity using the presence of subsidiaries to indicate a diversified company. In our sample, most companies do not have subsidiaries, so we use a dummy variable rather than a continuous variable, coding it as one if a sample company has any subsidiaries, otherwise zero. In common with other studies (e.g. Senkow *et al.*, 2001; Hay and Davis, 2004) we measure leverage as total debt divided by total assets. Ownership dispersion is measured as the total number of shareholders, and board size is the total number of directors on the board at the year end.

### 4.2.2 Company risk measures

We measure company performance as profitability (return on assets (ROA)). We also include an interest coverage variable as a measure of how well the company is able to service its



debts. This is a dummy variable, coded one if the company (a) reports non-zero interest expense for the year and (b) the company's profit before interest and taxation, divided by interest expense, is higher than the median for all sample companies with non-zero interest expense; all other company-years are coded zero. As earnings management may have changed in the voluntary audit regime (Dedman and Kausar, 2012), we measure ROA using data from 2003, when all sample companies were required to have audits. Company age is measured as the number of years since incorporation. Following Simunic (1980), we define risky balance sheet assets as receivables and inventory, and measure these as a proportion of total assets. We also include in our tests the amount of cash reported at year end, again scaled by total assets (Godwin and Freedman, 1993).

#### 4.2.3 Raising capital

Private companies are able to raise equity finance from private investors and we expect that the voluntary demand for audits is greater among companies that intend to raise new equity capital. To control for this we include a dummy variable, which equals one if the company issues new equity during the 12 months following the current year end, otherwise zero.

#### 4.2.4 Audit services and NAS

Any UK company that has its financial statements audited is required to disclose the audit and non-audit fees that it pays to its auditor. If a company chooses to stop having an audit during the voluntary regime, it is not required to disclose the fees that it continues to pay to its former auditor for any recurring NAS. By necessity, our NAS variables are therefore measured using the NAS fee disclosures in the final year of the mandatory regime (i.e. 2003) when all sample companies were required to disclose the fees paid to their auditors for NAS. Following prior studies (e.g. DeFond *et al.*, 2002; Ashbaugh *et al.*, 2003), we measure NAS as the natural log of (one plus) NAS fees in 2003.<sup>13</sup>

#### 4.2.5 Demand for audit assurance

H5 predicts that a company with a higher demand for audit assurance in the mandatory regime is more likely to purchase an audit voluntarily. To test this, we include a dummy variable which equals one (zero) if the company was audited by a Big4 (non-Big4) audit firm during 2003 (the final year of the mandatory regime). Prior studies (Abdel-Khalik, 1993; Bell *et al.*, 2001) suggest that companies with a high demand for audit assurance pay higher audit fees so we include the natural logarithm of the audit fee paid by the company in 2003 as a predictor of its subsequent decision to purchase an audit voluntarily.

## 5. Analysis

### 5.1 Descriptive Statistics

Table 2 reports the descriptive statistics. We find that 62.4% of our sample companies continue to have audits in the years 2004–2006. However, untabulated statistics indicate a steady decline in voluntary audits over our sample period. Similar to the first year of Canadian exemption in which 73% of companies retained the audit (Rennie *et al.*, 2003), we find that 71% of our UK sample retained the audit in 2004, but this dropped to 60% in 2005, and then to 52% in

<sup>13</sup>To check whether our NAS results are robust, we also compute NAS as the ratio of non-audit fees to total fees (%NAS) and re-run our probit model given in Equation (1). The results are similar to those reported in the paper, i.e. there is a significant positive relation between %NAS and the likelihood of voluntary audits.



**Table 2.** Descriptive statistics (15,013 company-years)

Variable	Mean	SD	Min	Max
AUDIT	0.624	0.484	0	1
Total assets (£000)	1.186	727	80	2800
Sales (£000)	2.078	1352	26	5600
ln(ASSETS)	6.834	0.776	4.382	7.937
ln(SALES)	7.291	1.056	3.258	8.631
SUBSIDS	0.217	0.412	0	1
LEVERAGE	0.214	0.277	0	1.500
#SHAREHOLDERS	3.703	2.823	1	19
#DIRECTORS	3.793	1.528	2	10
ROA in 2003	0.090	0.213	-0.828	0.768
INTCOV	0.336	0.472	0	1
Company's age (years)	20.26	16.19	3	84
ln(AGE)	2.738	0.736	1.099	4.431
RECEIVABLES	0.311	0.215	0	1
INVENTORY	0.244	0.205	0	1
CASH	0.179	0.218	0	0.901
CAPDUM	0.138	0.345	0	1
Non-audit fees (£000) in 2003	0.826	3.151	0	24
ln(NAS)	0.213	0.633	0	3.219
%NAS	0.057	0.172	0	0.818
BIG in 2003	0.054	0.225	0	1
Audit fees (£000) in 2003	5.099	3.891	1	26
ln(AUDITFEE)	1.649	0.550	0.693	3.296

Notes: Unless otherwise stated, all variables are measured during the sample period, 2004–2006.

AUDIT = one if the company voluntarily purchases an audit, zero if the company elects not to have an audit;

ln(ASSETS) = natural log of total assets; ln(SALES) = natural log of total sales; SUBSIDS = if the company has one or more subsidiaries, zero otherwise; LEVERAGE = total debt divided by total assets; #SHAREHOLDERS = the total number of shareholders; #DIRECTORS = the total number of directors on the board; ROA = pre-tax profits divided by total assets in 2003; INTCOV = one if interest coverage (profits before interest and tax divided by the interest expense) is above the sample median, zero otherwise; ln(AGE) = natural log of the company's age; RECEIVABLES = receivables/total assets; INVENTORY = inventory/total assets; CASH = cash and cash equivalents/total assets; CAPDUM = one if the company issued new equity capital during the current year; ln(NAS) = the natural log of (one plus) non-audit service fees in 2003; %NAS = non-audit service fees divided by total (audit and non-audit) fees in 2003; BIG = one if the company was audited by a Big Four audit firm in 2003, zero if non-Big Four; ln(AUDITFEE) = the natural log of (one plus) audit fees in 2003.

2006. This is consistent with companies either learning late that they can opt out of audit, or with them needing time to adjust their banking covenants in order to take advantage of the audit exemption. Our multivariate tests control for this trend in two ways. First, we include the YEAR05 and YEAR06 dummy variables to allow the model intercept to vary by year. Second, we run our regression models on each sample year individually.

Sample companies are small, with mean total assets of £1.2m and mean sales of £2.1m; 21.7% have at least one subsidiary and average leverage is 21.4%. The mean number of shareholders and board members is less than four, confirming that private companies have relatively high concentration of ownership and control. The companies generate an average ROA of 9%. Around a third of our sample companies do not report any interest expense and so the average for our above-median interest coverage measure is also around a third. The companies have been incorporated for 20.26 years, on average. Receivables, inventory, and cash make up 31.1%, 24.4% and 17.9% of total assets, respectively. 13.8% of our observations issued equity in the following year. Average audit and non-audit fees are £5099 and £826, respectively, and 5.4% of our companies employed Big Four auditors in 2003.

## 5.2 Univariate Analysis

**Table 3** presents the mean values of our independent variables for companies that have voluntary audits (AUDIT = 1;  $n = 9372$ ) and those that do not have voluntary audits (AUDIT = 0;  $n = 5641$ ).

Consistent with H1 (agency costs), the univariate comparisons indicate that companies purchasing an audit are larger, on average, than those which do not retain the audit. Our finding that audited companies are more likely to have at least one subsidiary has not been documented in prior research. Leverage is higher in audited companies compared to unaudited companies, although the difference is significant at only the 10% level ( $t$ -statistic = 1.782). This may be due to companies having long relationships with lenders, who have private access to timely, inside information about the company (Fama, 1985). Although prior researchers have speculated that ownership dispersion likely affects the audit decision (Senkow *et al.*, 2001), this has been difficult to test previously due to lack of data.<sup>14</sup> Our results, however, indicate that audited companies do have more dispersed ownership, measured as the number of shareholders. In line with companies using the audit to reduce communication and control issues stemming from larger boards, we also find that audited companies have more directors than unaudited companies. Taken together, these results strongly support the hypothesis that private companies with higher agency costs are more likely to purchase an audit.

H2 focuses on whether the company risk measures – financial performance, the ability to service debts, the proportion of balance sheet assets classed as ‘risky’, and the age of the company – are associated with the audit purchase decision. The results show that audited companies reported significantly lower profits (ROA = 7.3%) than unaudited companies in 2003 (ROA = 11.9%;  $t$ -stat for difference in means = 12.88). This is in line with companies with worse performance wishing to signal to users of accounts that they are creditworthy (Rogers and Stocken, 2005). There is no difference in the proportion of companies with above-median ability to cover interest expense from profits in the audited versus non-audited sub-samples. There are also no significant differences in the average values of risky balance sheet components (inventory, receivables and cash), or in company age between audited and unaudited companies.

H3 posits that companies will be more likely to retain an audit if they intend to raise capital, a relationship untested in prior literature. H3 is supported by the results in **Table 3**, which shows that 15.4% of audited companies issue equity during the following year, compared to only 11.2% of unaudited companies; this difference is statistically significant ( $t = 7.252$ ).

H4 suggests that there is a positive association between the purchase of NAS and the audit retention decision. Although this has been tested in prior literature, no significant relationship has been observed (Senkow *et al.*, 2001; Seow, 2001). This may be due to prior problems with obtaining comprehensive samples and data. Our univariate results indeed show that audited companies made significantly higher NAS purchases in 2003, both in terms of absolute value and as a proportion of total fees.

Finally, the univariate results are consistent with H5, that companies exhibiting a greater demand for audit assurance in the mandatory audit period are more likely to retain the audit in the voluntary audit period. In particular, 6.7% of companies retaining the audit previously engaged a Big4 auditor in 2003, compared to only 3.1% of companies which later opted out of the audit ( $t = 9.466$ ). Further, the 2003 audit fees are significantly higher for companies which later retained the audit ( $t = 24.154$ ).

<sup>14</sup>One exception is Seow (2001) who finds a significant positive association between the number of non-director shareholders and voluntary audit in a small sample of 32 observations.

**Table 3.** Variable means for companies that purchase (do not purchase) audits (15,013 company-years)

Variable	AUDIT = 1 ( <i>n</i> = 9372)	AUDIT = 0 ( <i>n</i> = 5641)	<i>t</i> -Statistic
ln(ASSETS)	6.946	6.648	23.238***
ln(SALES)	7.366	7.164	11.468***
SUBSIDS	0.276	0.120	22.833***
LEVERAGE	0.217	0.209	1.782*
#SHAREHOLDERS	3.963	3.271	14.656***
#DIRECTORS	4.020	3.415	23.944***
ROA	0.073	0.119	−12.88***
INTCOV	0.332	0.342	−1.155
ln(AGE)	2.745	2.726	1.491
RECEIVABLES	0.311	0.311	0.250
INVENTORY	0.242	0.247	1.580
CASH	0.184	0.171	1.000
CAPDUM	0.154	0.112	7.252***
ln(NAS)	0.265	0.127	13.053***
%NAS	0.068	0.039	9.899***
BIG	0.067	0.031	9.466***
ln(AUDITFEE)	1.732	1.512	24.154***

Notes: Unless otherwise stated, all variables are measured during the sample period, 2004–2006.

AUDIT = one if the company voluntarily purchases an audit, zero if the company elects not to have an audit;

ln(ASSETS) = natural log of total assets; ln(SALES) = natural log of total sales; SUBSIDS = if the company has one or more subsidiaries, zero otherwise; LEVERAGE = total debt divided by total assets; #SHAREHOLDERS = the total number of shareholders; #DIRECTORS = the total number of directors on the board; ROA = pre-tax profits divided by total assets in 2003; INTCOV = one if interest coverage (profits before interest and tax divided by the interest expense) is above the sample median, zero otherwise; ln(AGE) = natural log of the company's age; RECEIVABLES = receivables/total assets; INVENTORY = inventory/total assets; CASH = cash and cash equivalents/total assets; CAPDUM = one if the company issued new equity capital during the current year; ln(NAS) = the natural log of (one plus) non-audit service fees in 2003; %NAS = non-audit service fees divided by total (audit and non-audit) fees in 2003; BIG = one if the company was audited by a Big Four audit firm in 2003, zero if non-Big Four; ln(AUDITFEE) = the natural log of (one plus) audit fees in 2003.

\*Statistically significant at 10% level.

\*\*Statistically significant at 5% level.

\*\*\*Statistically significant at 1% level.

In summary, the univariate comparisons in Table 3 provide strong support for: H1, agency costs; H3, requirement for capital; H4 joint provision of NAS and audit; and H5, prior demand for audit assurance. Limited support is found for H2, company risk.

### 5.3 Pairwise Correlations

Table 4 provides a correlation matrix. The pairwise correlations are not large (max = 0.358) indicating there are no problems with collinearity for our regression analysis.

### 5.4 Multivariate Analysis

This section reports the results for Equation (1) which tests the association between the purchase of a voluntary audit and variables designed to test our five hypotheses.

Table 5 reports the results from our main regression models. The first column contains results for the full sample, for which we also include year dummies. The other columns contain the results of running the model on individual sample years. In terms of H1, the results provide compelling evidence of a positive association between the demand for voluntary audit and agency costs. Consistent with H1, the size, complexity, ownership dispersion, and board size variables

**Table 4.** Pairwise correlations

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1 Audit	1															
2 ln(ASSETS)	0.186	1														
3 ln(SALES)	0.093	0.050	1													
4 SUBSIDS	0.183	0.248	-0.027	1												
5 LEVERAGE	0.014	0.032	-0.123	0.081	1											
6 #SHAREHOLDERS	0.119	0.142	0.002	0.125	-0.014	1										
7 #DIRECTORS	0.192	0.192	0.082	0.141	-0.043	0.358	1									
8 ROA	-0.105	-0.141	0.029	-0.146	-0.256	-0.096	-0.120	1								
9 INTCOV	-0.010	0.032	0.173	-0.024	-0.135	-0.044	-0.014	0.125	1							
10 ln(AGE)	0.013	0.194	-0.068	0.007	-0.132	0.069	0.132	-0.099	-0.032	1						
11 REC	-0.002	-0.230	0.228	-0.069	-0.082	-0.013	-0.024	0.010	0.092	-0.148	1					
12 INV	-0.013	-0.046	0.010	-0.004	0.101	-0.027	-0.027	-0.053	-0.013	0.035	-0.301	1				
13 CASH	0.029	-0.114	0.003	-0.045	-0.309	-0.020	0.017	0.156	-0.057	-0.018	-0.187	-0.275	1			
14 CAPDUM	0.059	0.080	0.006	0.090	0.000	0.093	0.072	-0.101	-0.029	0.064	-0.017	0.000	-0.017	1		
15 ln(NAS)	0.106	0.071	0.060	0.128	0.017	0.075	0.070	-0.122	-0.020	-0.053	-0.005	0.010	0.027	0.048	1	
16 BIG	0.077	0.056	-0.002	0.060	0.040	0.038	0.062	-0.064	-0.011	-0.014	-0.015	0.010	0.018	0.044	0.101	1
17 ln(AUDITFEE)	0.193	0.220	0.287	0.266	0.018	0.127	0.172	-0.213	0.004	0.077	-0.003	0.022	0.027	0.097	0.172	0.092

Notes: AUDIT = one if the company voluntarily purchases an audit, zero if the company elects not to have an audit; ln(ASSETS) = natural log of total assets; ln(SALES) = natural log of total sales; SUBSIDS = if the company has one or more subsidiaries, zero otherwise; LEVERAGE = total debt divided by total assets; #SHAREHOLDERS = the total number of shareholders; #DIRECTORS = the total number of directors on the board; ROA = pre-tax profits divided by total assets in 2003; INTCOV = one if interest coverage (profits before interest and tax divided by the interest expense) is above the sample median, zero otherwise; ln(AGE) = natural log of the company's age; RECEIVABLES = receivables/total assets; INVENTORY = inventory/total assets; CASH = cash and cash equivalents/total assets; CAPDUM = one if the company issued new equity capital during the current year; ln(NAS) = the natural log of (one plus) non-audit service fees in 2003; %NAS = non-audit service fees divided by total (audit and non-audit) fees in 2003; BIG = one if the company was audited by a Big Four audit firm in 2003, zero if non-Big Four; ln(AUDITFEE) = the natural log of (one plus) audit fees in 2003.

**Table 5.** Determinants of the company's decision to undergo a voluntary audit (2004–2006)

	Full sample ( $n = 15,013$ )		Year 2004 ( $n = 6274$ )		Year 2005 ( $n = 5033$ )		Year 2006 ( $n = 3706$ )	
	Coeff.	z-stat	Coeff.	z-stat	Coeff.	z-stat	Coeff.	z-stat
ln(ASSETS)	0.208	9.37***	0.215	8.12***	0.224	7.84***	0.182	5.53***
ln(SALES)	0.099	5.99***	0.114	5.51***	0.104	4.91***	0.077	3.28***
SUBSIDS	0.354	8.29***	0.421	8.29***	0.337	6.51***	0.287	4.94***
LEVERAGE	0.095	1.59	0.001	0.02	0.197	2.47**	0.095	1.05
#SHAREHOLDERS	0.017	2.63**	0.013	1.80*	0.009	1.18	0.031	3.66***
#DIRECTORS	0.118	9.75***	0.105	7.56***	0.125	8.59***	0.127	7.88***
ROA	−0.207	−2.61***	−0.276	−3.10***	−0.174	−1.73*	−0.123	−1.04
INTCOV	−0.024	−0.84	−0.045	−1.19	0.013	0.31	−0.039	−0.82
ln(AGE)	0.006	0.25	0.034	1.36	0.017	0.59	−0.072	−2.01**
REC	0.257	3.00***	0.257	2.53**	0.292	2.67***	0.216	1.71*
INV	0.277	3.29***	0.205	2.06**	0.337	3.11***	0.313	2.49**
CASH	0.438	5.28***	0.308	3.09***	0.599	5.55***	0.429	3.56***
CAPDUM	0.208	5.74***	0.283	1.10	0.217	5.32***	0.175	1.46
ln(NAS)	0.123	4.50***	0.055	1.75*	0.160	4.59***	0.172	4.42***
BIG	0.273	4.54***	0.112	1.41	0.371	3.83***	0.438	3.82***
ln(AUDITFEE)	0.213	6.55***	0.246	6.48***	0.215	5.39***	0.153	3.42***
YEAR05	−0.395	−18.15***						
YEAR06	−0.538	−23.75***						
Constant	−2.776	−13.80***	−2.905	−11.91***	−3.486	−13.37***	−2.709	−9.08***
Industry effects		Yes		Yes		Yes		Yes
Pseudo $R^2$		11.57%		9.49%		11.57%		9.72%

Note: The dependent variable equals zero if there is no audit, one if there is an audit. Variables are defined as in Table 4.

\*Statistically significant at 10% level.

\*\*Statistically significant at 5% level.

\*\*\*Statistically significant at 1% level.

are all significantly positively associated with having an audit. Further, with the exception of ownership dispersion (#SHAREHOLDERS) these agency measures remain positive and significant when we estimate the models on each year individually. Although significant in the full sample test and in other years, the #SHAREHOLDERS coefficient is insignificant in 2005, although its sign remains positive. The coefficient on LEVERAGE, though consistently positive as expected, fails to reach conventional levels of significance in any year except 2005. This may be due to relationship lending where the lender demands bespoke information, or to the directors of private companies offering their own assets as security for business loans. In this case, the banks would require validation of asset values from a source different to the audit, such as a report from a surveyor.<sup>15</sup>

In line with the univariate results, company performance is negatively associated with voluntary audit. For the reported tests we use ROA measured in 2003 because of the possibility that earnings management behaviour differs between the audit and no-audit sub-samples in the subsequent voluntary audit regime. The relationship between profitability in 2003 and the audit decision weakens over time, becoming insignificant by 2006.<sup>16</sup> Company age is generally insignificant, except in 2006, when we observe a negative relationship. In this year, younger companies are more likely to purchase an audit. Risky balance sheet components, RECEIVABLES, INVENTORY and CASH, are all positively associated with AUDIT in the multivariate analysis, and the relationships are all statistically significant. These results are consistent with riskier companies having a greater demand for voluntary audit as predicted by H2.

Consistent with H3 (capital raising), the full sample results show a significant positive association between purchasing a non-mandatory audit and raising capital in the following year. The association between CAPDUM and AUDIT is positive in all tests, but only significant in the full sample and 2005.

The regression tests also provide support for H4, that private companies are more likely to retain the audit if they purchased other services from their auditor in 2003. The association between ln(NAS) and AUDIT is significantly positive in the full sample and in each individual year.

H5 is that prior demand for audit assurance, evidenced by the use of a Big 4 auditor or the payment of a higher audit fee in 2003, is positively associated with voluntary audit. This hypothesis is also generally supported by the results in Table 5. The purchase of a non-mandatory audit is positively associated with both BIG and ln(AUDITFEE), and the coefficients are all significant, apart from BIG in 2004.

The coefficients on the year dummies in the full sample tests are negative and significant, reflecting the trend away from voluntary audit over time.<sup>17</sup>

<sup>15</sup>We thank an anonymous reviewer for pointing this out to us.

<sup>16</sup>In untabulated tests, we replace ROA2003 with contemporaneous ROA. The relationship remains negative but less significant. (This may be due to differences in the reporting practices of audited and unaudited companies but investigating this is beyond the scope of this study.) Coefficients and *t*-statistics on ROA obtained in those tests are: for 2004 coeff. =  $-0.047$  ( $t = -0.54$ ); for 2005 coeff. =  $-0.096$  ( $t = -0.99$ ); for 2006 coeff. =  $-0.34$  ( $t = -2.93$ ). In the pooled test the coefficient is negative ( $-0.139$ ) and significant ( $t = -2.39$ ). The signs and significance of the other variables are not altered significantly.

<sup>17</sup>The Pseudo  $R^2$ s in Table 5 range from 9.49% to 11.57% indicating that there are other unmodelled factors that affect the voluntary demand for auditing. However, this level of explanatory power is similar to prior research explaining a company's decision to have an external audit compared to no audit. For example, the study by Carey *et al.* (2000) reports a Pseudo  $R^2$  of 14.1%; Hay and Davis (2004) report a Pseudo  $R^2$  of 10.8% for their model of auditor choice (0 or 1). In addition, the Pseudo  $R^2$ s in probit models tend to be much lower than the  $R^2$ s in OLS models because the continuous dependent variable in probit models is unobserved (Veall and Zimmerman, 1996). Further we report the more

## 6. Sensitivity Analysis

In this section we conduct additional tests to assess the robustness of the results documented in Table 5. In our first set of tests, we adopt alternative approaches to controlling for company size. In our second set of tests, we focus on whether agency problems affect the observed positive relationship between the voluntary purchase of audit and the purchase of NAS.

### 6.1 Effects of Company Size

If larger companies are more likely to retain the audit then, *ceteris paribus*, it is possible that some of the variables in our main tests may be capturing a size effect. For example, it could be that the number of directors increases as company size increases, or that larger companies will be subject to higher audit fees (e.g. Clatworthy and Peel, 2007). We address these issues by re-estimating equation (1) using a size-matched sub-sample; a size-truncated sub-sample; replacing the audit fee variable with an unexpected audit fee variable; and replacing the number of directors variable with one that is adjusted for company size.<sup>18</sup> The results for these sensitivity tests are presented in Table 6 and are similar to Table 5, column 1. In particular, the size-truncated and size-matched tests suggest that size has little impact on the relation between the demand for auditing and other hypothesised variables. Similar findings are obtained when the variables measuring audit fee and the number of current directors are adjusted for size (and other factors).<sup>19</sup>

### 6.2 Agency Costs and the Association Between NAS and Voluntary Auditing

As our sample consists of small, private companies, it is an open question whether our results are generalisable to publicly traded companies. An important difference between our sample and public companies is in the level of agency costs associated with the separation of ownership and control (e.g. Firth, 1997). If agency costs influence the spillovers between NAS and auditing, we would expect to find different results after partitioning the sample into companies that have high/low agency costs. We use the number of shareholders as a measure of agency costs and partition our sample on the median number of shareholders. We then explore whether the association between NAS and voluntary audits is different for companies that have high/low numbers of shareholders.

In untabulated tests, we find that agency problems do not influence the relationship between voluntary audit and the purchase of NAS; there are significant positive associations between NAS and voluntary audits in both closely held and widely held companies. Similar results are found in untabulated tests when the models are estimated for companies that are owner-managed (i.e. #SHAREHOLDERS = 1) although the statistical power is limited by the presence of relatively few of these companies. To further assess the robustness of our results, we conduct

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common McFadden (1973) Pseudo  $R^2$  which is generally much lower than alternative Pseudo- $R^2$  measures (Veall and Zimmerman, 1996).

<sup>18</sup>The size-matched sample is constructed by matching the companies that purchase a voluntary audit with companies that cease to be audited where the matching is based on total assets and year ends. The size-truncated sample consists of all companies that opt out of audit and the smallest 80% of firms that retain the audit in terms of their total assets.

<sup>19</sup>The unexpected audit fee is computed using the residuals from a standard audit fee model employed in prior literature (e.g. DeFond *et al.*, 2002). Details of the model are available from the authors upon request. The size-adjusted board measure is the residual from a regression of the number of current directors on the natural log of total assets. In untabulated tests, we replace ROA2003 with contemporaneous ROA. The relationship between contemporaneous profitability and voluntary audit remains negative and is significant in all years at 5% or better. The signs and significance of the other variables are not altered significantly.



**Table 6.** Sensitivity tests

	Size-truncated sample		Size-matched sample		Unexpected audit fee		Size-adjusted board measure	
	Coeff.	z-stat	Coeff.	z-stat	Coeff.	z-stat	Coeff.	z-stat
ln(ASSETS)	0.034	1.38	−0.003	−0.12	0.226	10.19***	0.253	11.29***
ln(SALES)	0.141	7.58***	0.070	3.97***	0.132	8.22***	0.099	5.99***
SUBSID	0.347	7.48***	0.382	8.73***	0.413	9.84***	0.354	8.29***
LEVERAGE	0.068	1.08	0.139	2.16**	0.115	1.93*	0.095	1.59
#SHAREHOLDERS	0.014	2.11**	0.019	2.79**	0.019	2.94***	0.017	2.63**
#DIRECTORS	0.121	9.35***	0.121	9.74***	0.122	10.08***		
#DIRECTORS_SA							0.118	9.74***
ROA	−0.215	−2.67***	−0.231	−2.69***	−0.234	−2.96***	−0.207	−2.61**
INTCOV	−0.003	−0.11	−0.043	−1.44	−0.032	−1.11	−0.024	−0.84
ln(AGE)	0.003	0.12	0.009	0.36	0.018	0.77	0.006	0.25
REC	0.342	3.78***	0.214	2.40**	0.267	3.12***	0.257	3.00***
INV	0.340	3.77***	0.256	2.96***	0.309	3.67***	0.277	3.30***
CASH	0.492	5.66***	0.433	4.93***	0.485	5.86***	0.438	5.28***
CAPDUM	0.193	4.97***	0.213	5.69***	0.209	5.79***	0.208	5.74***
ln(NAS)	0.114	4.00***	0.128	4.50***	0.124	4.53***	0.123	4.50***
BIG	0.279	4.37***	0.285	4.53***	0.303	5.04***	0.273	4.54***
ln(AUDITFEE)	0.234	6.77***	0.233	6.87***			0.213	6.55***
ln(UNEXPAUDITFEE)					0.208	6.39***		
YEAR05	−0.400	−17.41***	−0.389	−17.16***	−0.396	−18.17***	−0.395	−18.15***
YEAR06	−0.549	−22.90***	−0.536	−22.96***	−0.539	−23.75***	−0.538	−23.75***
Constant	−1.652	−7.61***	−0.603	−2.70***	−2.869	−14.23***	−2.633	−13.11***
Industry-specific effects	Yes		Yes		Yes		Yes	
N		13,139		18,744		15,013		15,013
Pseudo R <sup>2</sup>		9.91%		9.72%		11.57%		11.59%

Note: Variables are defined as in Table 4 and Section 6.

\*Statistically significant at 10% level.

\*\*Statistically significant at 5% level.

\*\*\*Statistically significant at 1% level.

similar tests by splitting our sample on the median values of the number of directors, leverage, and company size respectively. Our conclusions based on these alternative measures of agency costs are no different. Overall, the evidence does not suggest that the relationship between NAS and auditing depends upon the extent of agency problems within a company.

## 7. Summary and Conclusions

Mindful of the negative externalities that could occur if an insufficient number of companies purchased voluntary audits, regulators generally require all public companies to be audited. This, coupled with the regulatory tendency *not* to require private entities to file financial statements, has made it difficult for researchers to locate an environment, where they can empirically test the theoretical determinants of the voluntary demand for auditing. The UK has recently provided an appropriate experimental setting, however, by moving from a policy of universal mandatory audit to one, where many private companies are exempt from audit, while still being required to publicly file their financial statements. We exploit this setting to test the determinants of voluntary audit using a larger sample of companies, a more comprehensive set of variables, and a longer time period, than has been available to previous researchers.

We use agency theory and prior literature in the development of our hypotheses, which predict that companies are more likely to purchase an audit if: (H1) they have higher agency costs; (H2) they are riskier; (H3) they will shortly require new capital; (H4) they purchase NAS from the auditor; and (H5) they demonstrated a greater demand for audit assurance in the mandatory audit regime.

Our analysis provides support for each of our hypotheses. Companies with higher agency costs, which we argue to be positively associated with company size, complexity, leverage, ownership dispersion, and board size, are more likely to purchase a voluntary audit. Riskier companies – measured as those with poorer accounting performance and riskier types of risky balance sheet assets (inventory, receivables and cash) – are also more likely to retain the audit. We find some evidence that companies issuing equity in the next accounting period are more likely to retain an audit. Consistent with positive spillovers between the provision of NAS and audit, we find that companies which purchased NAS from their auditor in 2003 were more likely to continue purchasing an audit in 2004–2006. Moreover, companies that hired Big4 audit firms or that paid higher audit fees in 2003 are more likely to retain the audit during the voluntary regime.

Examining a three-year period allows us to document that, over time, more and more companies have exercised the option not to have an audit. This suggests that there is a period of adjustment before companies are able to benefit from the exemption (e.g. they need time to renegotiate their banking covenants). The determinants of voluntary audit purchase, however, remain relatively stable over the three-year sample period.

In sum, by using a larger, recent sample, a more comprehensive set of variables, and a longer time period than has been available previously, this study both supports and extends prior literature, which has hypothesised (but found difficult to test) that companies will rationally select into audit when it is not a regulatory requirement. Future researchers may wish to examine the *consequences* of companies choosing to retain or opt out of the audit. Others wishing to improve upon our work may find other factors that influence the demand for voluntary audit, such as the equity ownership of the directors and the strength of family ties to the board.

## Acknowledgements

This paper has benefited greatly from the input of seminar participants at the Universities of Bath, Warwick, Exeter and Cardiff. Useful comments were also received from academics

attending the BAFA and AFAANZ conferences. We are particularly grateful to Vivienne Beattie, Peter Carey, Mark Clatworthy, Andy Stark and Teri Yohn for sharing their thoughts with us. The efforts of the associate editor, Ann Vanstraelen, and two anonymous reviewers helped us to improve the paper substantially. Remaining errors are our own.

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